

## ***Interactive comment on “Longpath DOAS tomography on a motorway exhaust gas plume: numerical studies and application to data from the BAB II campaign” by T. Laepple et al.***

### **Anonymous Referee #2**

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The paper addresses relevant scientific questions within the scope of ACP.

The paper presents novel concepts, ideas, tools, and data.

Substantial conclusions are reached.

The scientific methods and assumptions are generally valid and clearly outlined. But in chapter 1.2 the very important statement that DOAS is a multi-component measurement method must be outlined in detail. This statement is not generally true. As the spectral regions for gas concentrations retrieval are different the statement is only valid if all spectral regions are measured simultaneously. If a grating spectrometer is used the spectral ranges of gas absorption are measured one after the other so that the gas

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concentrations are measured one after the other. In that case the basic condition of the outlined method in this paper is not fulfilled.

The results are generally sufficient to support the interpretations and conclusions. But the temporal stability of the NO<sub>2</sub> plume is not discussed (e.g. chapter 6). This is necessary because the measurements at the different paths are not performed simultaneously. The plume is influenced not only by wind variations and emission variations but by chemical reactions also. If the meteorological situation is discussed it should be specified. What means at p. 27 "the concentration fields correspond well with Bäumer (2002)"? The a priori concentration fields should be shown because these are calculated from Bäumer (2002). The maxima of concentrations in higher altitudes in Fig. 7 should be discussed.

The description of experiments and calculations are sufficiently complete and precise to allow their reproduction by fellow scientists.

The authors give proper credit to related work and clearly indicate their own new/original contribution.

The title clearly reflects the contents of the paper.

The abstract provides a concise and complete summary.

The overall presentation is well structured and clear.

The language is fluent and precise.

The mathematical formulae, symbols, abbreviations, and units are correctly defined and used. But what is IMK Karlsruhe?

The number and quality of references is appropriate.

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Interactive comment on Atmos. Chem. Phys. Discuss., 4, 2435, 2004.

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